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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,536	01/22/2002	Leonid N. Grigorov	QPTC-1004US0 SRM/DBB	6040
23910	7590	12/13/2004	EXAMINER PERT, EVAN T	
FLIESLER MEYER, LLP FOUR EMBARCADERO CENTER SUITE 400 SAN FRANCISCO, CA 94111			ART UNIT 2829	PAPER NUMBER

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/056,536

Applicant(s)

GRIGOROV ET AL.

Examiner

Evan Pert

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0303</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant's claim of priority to provisional application 60/263,386 (filed January 23, 2001) is acknowledged.

Drawings

2. The drawings are non-compliant with 37 CFR 1.84(p)(3), which states that lettering and numbering "must" measure minimum 1/8 inch in height. Correction is required.

Specification

3. The disclosure contains informalities, such as "with in" at line 27 of p. 1, "temperaturesz" at l. 1 of p. 3, "at one" at l. 26 of p. 3, and "descdribe" at l. 4 of p. 5. Applicant is encouraged to review the lengthy specification. Correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention:

Claim 2

The term "close" in claim 2 is a relative term, which renders the claim indefinite. The term "close" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not reasonably understand the scope of the invention as claimed.

In applicant's method of making a conductor, precursors and a doping agent form a positively charged group and a negatively charged group that are "close" (step c) and then are "separated" (step d of claim 2).

The method of claim 2 is ambiguous because a "conductor" necessarily has positive and negative charge groups spaced "close" together or "far apart," depending on a relative reference distance, yet these groups are always "separated" to some degree simply because negative and positive charge not occupy the exact same location at the exact same time.

Since applicant does not disclose quantification of "close" and "separated," in the context of applicant's claimed invention, one of ordinary skill in the art would not be able to understand the scope of applicant's method if it were to be patented as presented in original claim 2.

Claim 1

The concept of "crystallized electron pairs" is essential to understanding applicant's claimed "conductive material." A search of the prior art suggests that applicant is the only entity to coin this term to date, yet the concept of the term "crystallized electron pairs" is ambiguously developed in a sentence at [0077], which seems to state that a "crystallized electron pair" is a pair of coherent (bound) electrons with parallel spin in the same direction and having a stationary wave function.

Therefore, applicant's term "crystallized electron pair" seems to be equivalent to an unconventional Cooper pair of electrons that have spin in the same direction, for a total spin = 1 (rather than spin the opposite directions, for a total spin = 0).

Furthermore, since the limitation of "crystallized electron pairs" is a new term in the art to distinguish applicant's "conductive material" from prior art conductive material, the record should be clear what test or measurement can be made to determine if a material has a "pair of crystallized electrons." Theory alone does not properly establish scope of a patent claim; a potential infringer must be able to clearly understand how to determine the absence or presence of "crystallized electron pairs" in *their* inventive conductive materials, and other materials yet to be invented.

In the instant case, the examiner is treating the term "crystallized electron pairs" in accordance with applicant's ambiguous definition at [0077] (comprising a "stationary quantum particle build" of "two bound electrons" having "charge $-2e$ " and "spin 1") to mean "a pair of coherent electrons having the same spin in the same direction."

5. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The disclosure is ambiguous about steps of "forming a positive charge group and a negative charge group so that they are *close*" when "forming at least one charge transfer in a matrix" followed by "separating the groups" to form a conductive material.

Since the steps of claim 2 are ambiguous, one of skill in the art would not be able to practice the invention of claim 2. Applicant's long specification contains a lot of theory and background, and gives some direction about things like "viscosity" and "nanowires," but fails to establish a clear scope or specific meaning of a "close" distance followed by some ambiguous "separating" distance.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Rice (i.e. 1998 Nature article entitled "An analogue of superfluid ^3He ") in view of Duffy et al. (Unconventional superconductors: how are the spins paired in?" From 2001 Annual Report of Neutrons for Science - April 2002).

Secondary Reference showing Universal Fact (MPEP 2124)

The secondary reference to Duffy et al. does not antedate applicant's effective filing date, and is only relied on as evidence of the *universal fact* that "crystallized electron pairs" in Rice have "spin 1" (wherein a "crystallized electron pair" is a wave-function-stationary "quantum particle build of two bound electrons that exist in a quantum state having charge $-2e$ and integer spin" [0077]), and wherein the scope of language about the "crystallized electron pairs" encompasses "electrons in pairs having aligned spins leading to triplet superconductivity" as stated in Rice).

Primary Reference Anticipates (35 USC 102b)

Rice discloses a conductive material (i.e. an unconventional superconductor, namely Sr_2RuO_4) comprising: at least two crystallized electron pairs (i.e. "electrons in pairs leading to triplet superconductivity," p. 628, left column); and a matrix (i.e. a lattice) comprising positive charges (e.g. Ru^{4+}), each of said electron pairs necessarily having "charge $-2e$ " (because a "pair" is "two," so 1 electron charge multiplied by two = $-2e$), and the triplet pairs having "spin 1" (since as evidenced by the secondary reference of *universal fact* to Duff et al., triplet superconductivity in Sr_2RuO_4 inherently has $S = 1$, or "spin 1," with "parallel alignment of electron spins within the electron pairs").

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar, can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
December 8, 2004



EVAN PERT
PRIMARY EXAMINER